① Find the exponential model $y = ab^x$ or $y = ae^{bx}$ that fits the two points $(1,2)(4,54)$

0	1	2	3	4
$\square$	2			54
$\cdot b$	$\cdot b$	$\cdot b$	$\cdot b$	

$$\frac{2 \cdot b^3}{2} = \frac{54}{2}$$

$$b^3 = 27 \qquad \boxed{b = 3}$$

$$y = a(3)^x$$

$$\frac{2}{3} = \frac{a3^1}{3}$$

$$\frac{2}{3} = a$$

$$\boxed{y = \tfrac{2}{3}(3)^x}$$

② Expand $\ln \frac{\sqrt{x}\, y^3}{z^5}$

$$\ln\sqrt{x} + \ln y^3 - \ln z^5$$

$$\tfrac{1}{2}\ln x + 3\ln y - 5\ln z$$

$$\boxed{y = \tfrac{2}{3}(3)^x}$$

$y = ab^x$ $y = ae^{bx}$

$y = \frac{2}{3}(3)^x$

$\frac{2}{3}e^{x\ln 3}$

$y = \frac{2}{3}e^{\ln 3^x} \Rightarrow \frac{2}{3}e^{\ln(3)x}$ ☆

$\frac{2}{3}e^{1.099x}$

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$$N = 100e^{kt}$$

$$300 = 100e^{k\cdot 5}$$

$$3 = e^{k\cdot 5}$$

$$\frac{\ln(3)}{5} = \frac{k\cdot 5}{5}$$

$$\boxed{k \approx 0.219}$$

$$N = 100e^{0.219t}$$

$$600 = 100e^{0.219t}$$

$$6 = e^{0.219t}$$

$$\frac{\ln 6}{0.219} = \frac{0.219t}{0.219}$$

$$t = 8.154$$

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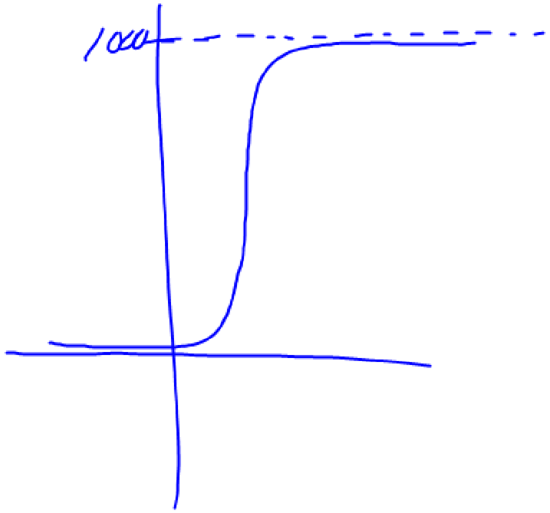
$$P(t) = \frac{1000}{1+9e^{-0.1656t}}$$



(b) $$\frac{1000}{1+9e^{-0.1656(5)}} \approx 202.745$$

(c) $$500 = \frac{1000}{\cancel{1+9e^{-0.1656t}}} \cdot \cancel{1+9e^{-0.1656t}}$$

$$500\left(1+9e^{-0.1656t}\right) = 1000$$

$$1+9e^{-0.1656t} = 2$$

$$\frac{9e^{-0.1656t}}{9} = \frac{1}{9}$$

$$e^{-0.1656t} = \frac{1}{9}$$

$$\ln \qquad \ln$$

$$-0.1656t = \ln\left(\frac{1}{9}\right)$$

$$\boxed{t = \frac{\ln\left(\frac{1}{9}\right)}{-0.1656} \approx 13.268}$$

p.239 #5-8, 34, 36, 43, 57, 69, 73, 87, 90, 97,

101, 106, solve 116 for x
if y=5.5